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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,293

05/23/2006

Amir Parham

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CONNOLLY BOVE LODGE & HUTZ, LLP  
P O BOX 2207  
WILMINGTON, DE 19899

EXAMINER

LISTVOYB, GREGORY

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

07/29/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,293	<b>Applicant(s)</b> PARHAM ET AL.	
	<b>Examiner</b> GREGORY LISTVOYB	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17-23 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17-19, 23 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

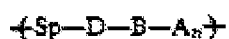
## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 -9 rejected under 35 U.S.C. 102(b) as being anticipated by Fischer et al (US 5212269) herein Fischer.

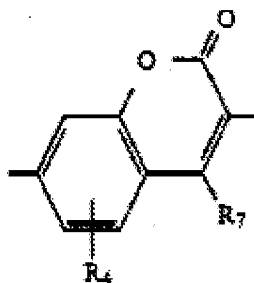
Fischer teaches conjugated polymer of the following formula (see Column 3, line 40):



where D-B-A is a chromophoric unit

where D is an amine, A is electron accepting group

Where B is the following (see Column4, line 20):



where R<sub>4</sub> and R<sub>7</sub> are alkyls.

Coumarin-based polymer, substituted with Alkyls meet the limitations of claims 1-6. Regarding claims 7-9, Fischer teaches amino-aromatic structures in his polymer (see claims 5-10), which include 1,4 phenylene units.

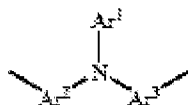
***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15, 17-19, 23, 25-28 rejected under 35 U.S.C. 103(a) as being unpatentable over Treacher et al (WO 2002/077060, cited with equivalent US 7288617) herein Treacher in combination with and Chen et al (US 20030164499) herein Chen as evidences by Yun et al (US 5650456) herein Yun

Treacher discloses a polymer, comprising units with the following formula (see Column 3, line 60):



Formula (III)

where Ar 1, Ar 2 and Ar 3 can represent benzene, naphthalene or heterocyclic aromatics (see Column 8, line 55).

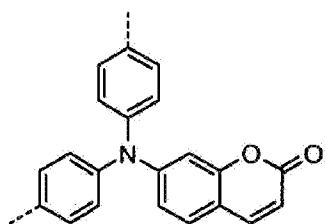
Regarding Claim 2, 3 and 5, Treacher does not specifically disclose a location of Structure 1 in the polymer chain. However, based on synthesis conditions (they are

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analogous in Treacher and in the Application), the above structure can be incorporated both in main and side chain of the polymer.

In reference to Claim 4, 6, 7-8, 9-11, 13-14 Treacher discloses a homo- and copolymers (having at least 1% mol of structure of Formula III, see Column 6, line 55), further fragments with the following units: 1, 4 naphthalenes, triarylamines, pyridines , etc (see Claim 16 and 19).

Treacher structure has the same arylamine fragment as a polymer of the Application examined (see Claim 28, Formula 21 of the Application examined):



Formula (21)

The only difference between Structures (III) and (21) is that Treacher's polymer has phenyl or naphthalene fragment instead of Coumarine's one of the Application. Note that both polymers are parts of Light Emitting Diodes (LED) (see Spec and Busing, line 0001, meeting the limitations of Claim 23, 25-26).

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Chen discloses fluorescent bis-coumarines with the above Formula (21) (see Abstract). Chen uses his compounds for LED.

Chen teaches that his compound combines well known photoluminescence properties of coumarine with good thermostability, provided with arylamine (see line 0004).

As evidences by Yun, electroluminescent polymers (see Column 7, line 65) having coumarine units (see Abstract) are known.

Regarding Claims 17-19, Chen teaches that coumarine-containing compound can be used in amount from 0.1 to 5 %wt based on the weight of the emissive layer, comprising one or more polymers (see Claim 9).

Therefore, it would have been obvious to a person of ordinary skills in the art to incorporate Chen's coumarine-containing units into Treacher's polymer in order to combine photoluminescence properties of coumarine with good thermostability, provided with arylamine.

### ***Response to Arguments***

Applicant's arguments filed 4/13/2009 have been fully considered but they are not persuasive.

Applicant argues that in contrast to the disclosure of Fischer, according to the Applicant's claim 1 only "conjugated polymers, oligomers and dendrimers" are claimed, which do not only contain a conjugated unit, but are conjugated in total.

Examiner disagrees. Term "conjugated polymers" in claim 1 is interpreted by Examiner as "polymer, having conjugated fragments". The polymer as claimed is not fully conjugated and thus, requires only few conjugated fragments to meet the claim limitations.

Regarding Rejection, based on Treacher in view of Chen, Applicant argues that even if both units are used in polymers as part of OLEDs, as stated by the Examiner, the unit of formula (III) is used as a "hole-transporting unit" (see col. 6, lines 40-65) whereas the unit of formula (21) of the present application is used as a "light emitting unit".

Examiner disagrees. In all cases conjugated fragments are used (Application, Treacher and Chen). Therefore, they both can be considered as light emitting units. Note that "light emitting unit" is not claimed. Additionally, Treacher and Chen disclose the application of their copolymers in OLEDs.

Applicant submits that Comparative Example VI of the Application examined, which has a similar structure to one of Treacher's polymer, has an inferior performance, compare to Inventive Structure.

Examimer disagrees. Firstly, as admitted by the Applicant, the structures above have different ingredients and thus, not fully comparable. In addition, secondary reference (Chen) teaches Coumarine-containing fragment, which overcomes the above differences.

Applicant argues that Examiner used hindsight reconstruction of the claimed invention.

Examiner disagrees. The reason of Chen's modification of Treacher's polymer is to increase its photoluminescence properties, whereas Applicant teaches that coumarine increases "photostability and thus the lifetime of blue conjugated polymers".

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY LISTVOYB whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James J. Seidleck/

Supervisory Patent Examiner, Art Unit 1796

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